REMARKS:

1) Referring to item 10) of the Office Action Summary, the Examiner is respectfully requested to approve the formal drawings originally filed with this application.

2) The Notice of References Cited (Form PTO-892) enclosed with the Office Action has a typographical error in the date of the second reference. Please correct the file to show the date of the Werner et al. Patent to be **04**-1991, so that this reference is correctly identified in any patent issuing from this application.

3) A few minor editorial and clerical corrections have been made in the present specification. These editorial amendments are all supported by the substance and context of the original disclosure, and do not introduce any new matter. Entry of the amendments is respectfully requested.

4) The claims have been amended as follows.

Independent claim 1 has been amended to incorporate limitations from original claims 2 and 9, and a further clarification (relating to the exclusion of zinc) based on the original disclosure at page 1, lines 20 to 26; page 2, lines 18 to 21; page 3, lines 22 to 24; page 9, lines 15 to 19; and page 14, lines 1 to 3 of the specification.

Claim 2 has been canceled because its subject matter has been incorporated into claim 1.

Claim 3 has been amended for improved conformance with amended claim 1.

Minor clerical amendments have been made in withdrawn claims 5 and 7.

Claim 9 has been amended with respect to the exclusion of zinc in a manner similar to claim 1.

New claims 11 to 15 have been added. Claim 11 depends from claim 1, and recites a narrower limitation of the manganese content within the range of claim 1. Claim 12 depends from claim 1 and is supported by the original disclosure at page 1, lines 7 to 14. New independent claim 13 is supported by original claims 1, 2, and 9 as well as the original disclosure at page 1, lines 20 to 26; page 2, lines 18 to 21; page 3, lines 22 to 24; page 9, lines 15 to 19; and page 14, lines 1 to 3. Claim 14 is supported by original claim 3. Claim 15 is supported by original claim 1 and page 4, lines 3 to 18. Claim 16 is supported by original claim 4. Claim 7 recites a narrower limitation of the manganese content within the range of claims 1 and 13.

The claim amendments and the new claims do not introduce any new matter, in view of the above cited original support. Entry and consideration of the claim amendments and the new claims are respectfully requested.

5) Referring to sections 1 to 4 on pages 2 to 3 of the Office Action, the election of the Group I claims 1 to 4, 9 and 10 directed to the aluminum alloy product is hereby affirmed. Present claims 1, 3, 4, and 9 to 17 are directed to the elected invention. The non-elected method-of-making claims 5 to 8 are

directed to a method of making the elected product, and depend from the elected product claim 4. In the event that elected claim 4 is ultimately found allowable, the Examiner is respectfully requested to rejoin, consider and allow the dependent method-of-making claims in accordance with M.P.E.P. §821.04 and §2116.01. For this reason, the non-elected withdrawn claims 5 to 8 are maintained in this application pending final resolution of the examination of the elected product claims.

6) Referring to section 6 on pages 3 to 4 of the Office Action, the rejection of claims 1 and 4 as anticipated by U. S. Patent 5,030,416 (Werner et al.) is respectfully traversed.

Independent claim 1 has been amended to further limit the compositional ranges of the compositional components in accordance with original claims 2 and 9. Since claims 2 and 9 had not been rejected as anticipated by Werner et al., and the compositional limitations thereof are now incorporated in claim 1, the rejection cannot be maintained against present amended claim 1 or its dependent claim 4.

Particularly, claim 1 is patentably distinguishable from the disclosure of Werner et al., because claim 1 requires a minimum amount of at least 1.0 mass % of manganese, while the alloy according to Werner et al. includes only up to a maximum of at most 0.8 % of manganese. Also, referring to the Comparative Example alloy A shown in the Table in col. 2 of this reference, it is noted that the silicon content is higher than the presently claimed range, and the iron content is lower than the presently

claimed range. For these reasons, present claim 1 is not anticipated by Werner et al.

The invention also would not have been obvious, because both the reference and the present application demonstrate that minor variations in the alloying components have substantial and significant influences on the resulting properties of the aluminum alloy. Therefore, based on the express teachings of the reference, a person of ordinary skill in the art would not have been motivated to vary the compositional contents of the several components out of the disclosed ranges and into the presently claimed ranges.

Further regarding dependent claim 4, the Examiner has asserted that the mechanical properties of the present inventive aluminum alloy foil are inherent properties of the aluminum alloy composition. The Examiner's assertion is respectfully traversed on two grounds. First, the presently claimed alloy composition does not coincide with the conventional composition disclosed by Werner et al., for the reasons discussed above. Secondly, the present application makes clear that the resulting mechanical properties of the aluminum alloy foil are **not** directly and exclusively an inherent consequence of the alloy composition, but rather are also dependent on, and variable with, the **processing conditions** used to manufacture the aluminum alloy foil. For example, Comparative Samples 13 and 14 in Table 5 on page 19 of the present specification have the same elemental composition (inventive composition no. 1 from Table 3) as the present Inventive Samples 1 to 12 of Table 5, but they have elongation and yield strength properties falling outside of the presently

claimed inventive ranges, entirely because the manufacturing conditions used to form these Comparative Samples are different from the manufacturing conditions used to form the Inventive Samples. Thus, the presently claimed mechanical properties are **not** inherent properties of the alloy composition.

For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 1 and 4 as anticipated by Werner et al.

7) Referring to section 8 on pages 4 to 6 of the Office Action, the rejection of claims 1 to 4, 9 and 10 as obvious over U. S. Patent 4,737,198 (Shabel et al.) is respectfully traversed.

Present independent claim 1 has been amended to recite the narrower limited ranges of various compositional components in accordance with original claims 2 and 9. Furthermore, claim 1 has been amended to make clear that the present inventive aluminum alloy essentially does not include zinc, namely excluding zinc except for an unavoidable amount of zinc that may be included as an unavoidable impurity.

The present specification explains that some prior art aluminum alloys have purposely included a significant amount of zinc in an attempt to reduce or control corrosion (see e.g. page 1, lines 22 to 25, and page 2, lines 10 and 11. Contrary to such prior art teachings, the present invention purposely excludes zinc (except for unavoidable impurities) in order to improve the corrosion resistance properties (see page 2, lines 18 to 21; page 3, lines 22 to 26; page 9, lines 15 to 19; and page 14, Table 2).

In comparison to present amended independent claim 1, the aluminum alloy composition according to Shabel et al. purposely contains a substantial amount of zinc (see col. 2, lines 15 and 43; and col. 4, lines 18 and 33 to 38).

Shabel et al. expressly teach that at least 0.7 wt.% and preferably at least 0.85 wt.% of zinc is necessary in the aluminum alloy composition for providing corrosion resistance (col. 2, line 43; and col. 4, lines 18 and 33 to 38). It is further clear from the Shabel et al. reference that the zinc is a purposeful compositional element, provided in an amount significantly greater than an unavoidable impurity amount. For example, while the minimum content of zinc is at least 0.7 wt.%, Shabel et al. refer to the unavoidable impurity contents of other components being no more than 0.06 or 0.02 wt.% (see e.g. col. 4, lines 23 and 24).

For the above reasons, present independent claim 1, which expressly excludes zinc except for an unavoidable impurity amount of zinc, is clearly distinguishable from Shabel et al. In view of the express teachings of Shabel et al. that a significant quantity of zinc is required for providing corrosion resistance, a person of ordinary skill in the art would not have been motivated to exclude zinc, as according to the present invention, to achieve such a goal of improving the corrosion resistance (which has been demonstrated by the present invention).

Furthermore, Shabel et al. disclose a range of silicon content from 0 to 0.5 %, which is a rather broad general range in the present context. As to the reasons or purposes for limiting the silicon content, Shabel et al. teach that silicon

contents greater than about 0.2 % make it difficult to control the dispersoid distribution and result in uncontrolled recrystallization during processing of the alloy (col. 4, line 31).

With such teachings regarding the broad general range of silicon content, the Shabel et al. reference has not disclosed the presently claimed very-limited range of silicon content with sufficient specificity. Namely, the present application makes clear that the silicon content must critically be limited to not more than 0.1% in order to improve the corrosion resistance of the aluminum alloy with respect to sodium chloride solutions and weakly acidic foods, and to improve the mechanical properties (see e.g. page 6, lines 6 to 19 of the present specification). The reference would not have suggested the criticality of the upper limit of the silicon content, nor the substantially improved corrosion resistance as presently achieved. Thus, the reference does not anticipate or make obvious the presently claimed range of silicon content, because Shabel et al. do not disclose any particular actual example within the presently claimed narrow range, but merely disclose a broad general range encompassing the presently claimed, much more limited and specific range. In this regard see M.P.E.P. §2131.03 and §2144.05. It is respectfully submitted that any prima facie case of obviousness of the presently claimed silicon content range has been overcome by the proof of improved corrosion resistance achieved by the presently limited range, as set forth in the present specification.

Independent claim 9 incorporates the same limitations and features as independent claim 1 discussed above, as well as those of dependent claim 4. For the same reasons discussed above, for example in view of the exclusion of zinc except for unavoidable impurity amounts thereof, claim 9 is also patentably distinguishable over the alloy composition disclosed by Shabel et al.

For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 1 to 4, 9 and 10 as obvious over Shabel et al.

8) Referring to section 9 on page 6 of the Office Action, the rejection of claims 1 to 3 as obvious over JP 62-007826 is respectfully traversed.

As discussed above, the compositional ranges of the components recited in independent claim 1 have now been more narrowly limited by the present amendment. This has reduced or avoided the recognized overlap with the disclosure of the Japanese reference.

As pointed out by the Examiner, the typical copper content of particular samples disclosed by the Japanese reference (0.01 wt.%) now only coincides with the maximum upper limit of 0.01% of copper recited in claim 1.

More importantly, the content amount of manganese in present claim 1 is at least 1.0 and up to 3.0 mass %, which merely touches the upper end of the range from 0.05 to 1.0 wt.% of manganese disclosed by the Japanese reference. While such a "touching" of the end points of the ranges could be used to

establish a prima facie case of obviousness, the further evidence of record overcomes any such prima facie obviousness. First of all, while the reference generally discloses the broad range of manganese from 0.05 to 1.0 wt.%, the specific examples disclosed in Table 1 of the reference have a manganese content of 0.3 wt.%, which does not fall in or border on the presently claimed range. Secondly, the present application establishes that it is critically important to provide at least 1% of manganese in the present aluminum alloy to simultaneously improve the corrosion resistance, strength, formability and rollability of the alloy (see e.g. page 6, line 30 and Table 2 on page 14). Also, the present application demonstrates that there is an interaction between the manganese and the iron content, so that both of these compositional contents must be taken into account relative to each other (see e.g. page 6, line 31 to page 7, line 33). For these reasons, the presently claimed higher range of manganese content (1.0 to 3.0 mass %) would not have been obvious from the disclosed general range extending up to 1.0 %, with specific examples of only 0.3 % manganese content.

In connection with the manganese content, as mentioned above, the iron content must also be considered. While the Japanese reference generally discloses a broad range of iron content from 0.5 to 3.0%, the present invention teaches and claims that it is necessary to more narrowly limit the iron content to a range of 0.7 to 1.2 mass %, in combination with the above mentioned range of manganese content (see e.g. page 6, line 31 to page 8, line 4). This combination of the two components (Fe and Mn) in combination in these ranges is critical for

achieving the improved corrosion resistance as well as the proper grain size and resulting yield strength and elongation of the aluminum alloy material (see e.g. Table 2 on page 14). The reference would not have suggested such a narrower limited range of iron content, especially to be maintained in combination with the presently claimed higher content of manganese.

For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 1 to 3 as obvious over JP 62-007826.

9) The new added claims recite additional features that further distinguish the invention over the prior art, for example as follows.

Claim 11, depending from claim 1, avoids any overlap or "touching" of the manganese content with the Japanese reference by requiring a manganese content of more than 1.0 mass %.

Claim 12 depends from claim 1 and is directed to an article of manufacture that consists of the aluminum alloy according to claim 1, wherein the article of manufacture is a container, a food wrapping foil material, a domestic article, or a decorative article. Such particular articles of manufacture are neither disclosed nor suggested by the Japanese reference, which instead discloses an aluminum alloy for cold forging uses. The presently claimed articles are not cold forged articles.

New independent claim 13 is generally directed to the aluminum alloy with a compositional content similar to claims 1 and 3, but expressly reciting that the aluminum alloy **consists of** the limited specified set of compositional components. Thus, all

other components (such as zinc) are expressly excluded from the composition recited in present claim 13.

Claim 14 depending from claim 13 recites that the aluminum alloy contains a specified positive amount of chromium, titanium and/or zirconium, while claim 15 includes not more than an unavoidable trace amount of these additional elements.

Claim 16 is directed to an aluminum alloy foil with properties corresponding to claim 4, but depending from claim 13.

Claim 17 depends from claim 13 and recites that the alloy contains more than 1.0 mass % of manganese.

Entry and consideration of the new claims are respectfully requested.

10) Favorable reconsideration and allowance of the application, including all present claims 1 and 3 to 17, are respectfully requested.

Respectfully submitted,

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7/23/03

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